

Remarks

Claims 21 and 58-70 have been cancelled. Claims 1-6, 9, 10, 12-17, 22, 37, and 53 have been amended. New claims 71 and 72 have been added leaving claims 1-20, 22-57, 71, and 72 pending in the application. The amendments to the claims and the new claims do not constitute new matter as they are supported by the originally filed specification at, for example, pages 6-14.

Applicant affirms election of Group I (claims 1-57) without traverse made by phone in response to the Examiners restriction requirement.

Claims 1-57 stand rejected as anticipated or obvious in view of US patent to Minter (US 6,255,035) alone or in combination with other references, or as anticipated by US patent to Lu (US 6,817,086). Applicant requests the Examiner reconsider these rejections in view of the amended claims as well as the remarks that follow for at least the reason that the cited references do not teach or suggest all the elements of the amended claims.

The amended claims are anticipated "only if each and every element as set forth in the claims are found, either expressly or inherently described, in a single prior art reference." *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). "The identical invention must be shown in as complete detail as is contained in the ... claim." *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1236, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989).

The Examiner also is respectfully referred to MPEP §2142, which recites, in part:

To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant's disclosure. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991).

In accordance with well established case law, the cited references must teach each and every element of the pending claims in order for the pending claims to be anticipated and/or obvious. The cited references do not satisfy this requirement.

Turning first to claim 1, a semiconductor processing patterning method is recited that includes, as amended, forming a first resist layer over a semiconductive substrate. Claim 1 goes on to recite, forming a second resist layer over the first resist layer and exposing overlapping portions of the first and second resist layers to actinic energy effective to change solubility of the exposed portions versus the unexposed portions of each of the first and second resist layers in a developer solution. Claim 1 then recites after the exposing, developing the first and second resist layers with the developer solution to form a mask pattern over the substrate. Claim 1 also recites that the mask pattern includes the first and second resist layers, with the first resist layer of the mask pattern including opposing sidewalls in at least one cross section, and the composition of the first resist layer extending continuously between the opposing

sidewalls of the first resist layer of the mask pattern. Claim 1 goes on to recite that the second resist layer of the mask pattern comprises opposing sidewalls in the one cross section, with the composition of the second resist layer extending continuously between the opposing sidewalls of the second resist layer of the mask pattern. Claim 1 then recites that an entirety of the opposing sidewalls of the first resist layer are received laterally inward of an entirety of the opposing sidewalls of the second resist layer in the one cross section. Claim 1 is allowable for at least the reason that the cited references do not teach or suggest an entirety of the opposing sidewalls of the first resist layer being received laterally inward of an entirety of the opposing sidewalls of the second resist layer in the one cross section with the first resist layer being formed over a semiconductive substrate.

The Minter reference has been cited by the Examiner as teaching opposing sidewalls of first resist inward of opposing sidewalls of second resist. However, portions of the sidewalls of Minter extend beyond the sidewalls of the second resist. As such Minter does not teach or describe an entirety of the opposing sidewalls of the first resist layer being received laterally inward of an entirety of the opposing sidewalls of the second resist layer as recited in claim 1. For at least the reason claim 1 recites elements neither taught nor suggested by Minter alone or in combination with the cited references, claim 1 is allowable.

The Lu reference has been cited by the Examiner as teaching all the elements of claim 1. However, the Lu reference is specifically directed at the production of sensors for read heads. Without conceding that Lu is related to

the field of semiconductor processing as recited in claim 1, Lu does not teach or describe forming resist over a semiconductive substrate as recited in claim 1. Understandably, because Lu is directed at read head manufacturing, it describes processes that include forming resist material over sensor materials such as electrically conductive material including ferromagnetic materials, which cannot be considered semiconductive materials. For at least the reason claim 1 recites elements that are neither taught nor suggested by Lu, claim 1 is allowable.

Claims 2-21, 71, and 72 depend from claim 1 and are allowable for at least the reasons given above regarding claim 1 as well as other patentable reasons. For example, new claim 71 recites the method of claim 20, reciting sidewalls of different shapes in the one cross section, with the opposing sidewalls of the first resist layer extending from the second resist layer to the semiconductive substrate. The cited references neither teach nor suggest sidewalls of different shapes extending from the second resist layer to the substrate. Also claim 72 recites claim 71 with the opposing sidewalls of the first resist layer being at least partially curved in the one cross section. The cited references do not teach or describes these features.

Turning next to claim 22, a semiconductor processing patterning method is recited that includes, as amended, forming a first positive resist layer over a semiconductive substrate and forming a second positive resist layer over the first positive resist layer. Claim 22 also recites that the first and second positive resist layers are different in composition, with the first positive resist layer having greater solubility in a developer solution than does the second positive

resist layer at least after exposure to actinic energy effective to increase solubility of each of the first and second positive resist layers in the developer solution. Claim 22 then recites exposing overlapping portions of the first and second positive resist layers to the effective actinic energy, and, after the exposing, developing the first and second positive resist layers with the developer solution. Claim 22 goes on to recite, the developing solution removing the exposed portions of the first positive resist layer at a faster rate than removing the exposed portions of the second positive resist layer effective to form a mask pattern over the substrate, with the mask pattern comprising the first and second positive resist layers. Claim 22 then recites that the first positive resist layer comprises opposing sidewalls in at least one cross section, with the composition of the first positive resist layer extending continuously between the opposing sidewalls of the first positive resist layer of the mask pattern. Claim 22 also recites that the second positive resist layer comprises opposing sidewalls in at least the one cross section with the composition of the second positive resist layer extending continuously between the opposing sidewalls of the second positive resist layer of the mask pattern. Claim 22 then recites that at least a portion of the opposing sidewalls of the first positive resist layer of the mask pattern are recessed laterally inward of at least a portion of opposing sidewalls of the second positive resist layer in the one cross section.

Claim 22 is allowable for at least the reasons that the cited references do not teach the method over a semiconductive substrate or developing the first and second positive resist layers with the developing solution removing the

exposed portions of the first positive resist layer at a faster rate than removing the exposed portions of the second positive resist layer effective to form a mask pattern over the substrate.

Claim 22 has been rejected as anticipated either by Minter or Lu. As discussed above Lu does not teach or describe processes over semiconductive substrate. For at least the reason claim 22 recites forming a first positive resist over a semiconductive substrate, claim 22 is allowable in view of Lu.

The Examiner has relied on Minter for anticipating claim 22 a well. However, Minter describes a process that removes photoresist layers individually, not developing the first and second positive resist layers with the developing solution removing the exposed portions of the first positive resist layer at a faster rate than the exposed portions of the second positive resist layer. Minter describes first developing the imagewise exposed second photoresist layer (the one above the first photoresist layer) and removing all or substantially all of the second photoresist layer from the exposed areas. (Col 9, lines 27-35): Minter then describes the development of the imagewise exposed first photoresist layer, but at no point does Minter teach or suggest a developing solution removing the exposed portions of the first positive resist layer at a faster rate than the exposed portions of the second positive resist layer. This is understandable since Minter teaches that the exposed portions of the second positive resist layer are removed before developing the first photoresist layer. For at least these reasons, claim 22 is allowable in view of the Lu and Minter references.

Claims 23-36 depend from claim 22 and are allowable for at least the reasons given above regarding claim 22 as well as other patentable features. For example, claim 34 recites the method of claim 22 including etching material of the substrate using the mask pattern as a mask. Understandably, Minter does not teach or suggest this limitation as it is directed at additive imaging processes rather than subtractive imaging processes. (Col. 1, line 54).

Lastly claim 37 recites, as amended, a semiconductor processing patterning method that includes forming a first composition resist layer over a semiconductive substrate and forming a second composition resist layer over the first composition resist layer. Claim 37 goes on to recite exposing overlapping portions of the first and second composition resist layers to actinic energy effective to initiate formation of a mask pattern having a second mask block over a first mask block, with the solubility of the first mask block being greater than the solubility of the second mask block in a developer solution. Claim 37 then recites developing the first and second composition resist layers with the developer solution under conditions effective to remove the material of the first mask block at a faster rate than removing the material of the second mask block and form the mask pattern.

Claim 37 has been rejected as anticipated by Minter or Lu. However, as discussed above, Lu does not teach forming a first composition resist layer over a semiconductive substrate, because Lu is directed at the production of sensors on read head devices and further, Minter does not teach or describe developing

as recited in claim 37. For at least these reasons, claim 37 is allowable in view of the cited references.

Claims 38-57 depend from claim 37 and are allowable for at least the reasons given above regarding claim 37.

This application is believed to be in condition for allowance and action to that end is requested. The Examiner is requested to telephone the undersigned in the event that the next office action is one other than a Notice of Allowance.

Respectfully submitted,

Dated: 9/6/05

By: 

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